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CS 162 Winter 2018
Project 3 Design and Reflection

Project 3 – Design and Reflection Document

Problem:

Project 3, Fantasy Combat Game, is part 1 of a larger project that involves game development. In this Project, we create an abstract Character class, and derives 5 sub-classes that inherit Character's protected data members and public functions. These derived classes each define its own set of Attack and Defense rules that contain their special abilities. For this part, we are asked to create a test program to check each class' attack and combat abilities.

Requirements:

a) Display menu to select characters.
b) Combat includes: Player 1 Attacks, Player 2 Defends; Player 2 Attacks, Player 1 Defends; Calculate damage and update stats.
c) Continue game until one of the characters is at 0 or less strength points.
d) Character class should be abstract, meaning that it has at least one pure virtual functions.
e) Dice rolls are randomized. Each character has its own set of dice for attack and defense.
f) Display character stats at the end of each round.
g) At the end of the game, asks player if they want to play again or exit.
h) Vampires can use Charm, which has 50% chance of taking no damage from attacker.
i) Barbarians have no special abilities.
j) Blue Men loses a die every 4 points of cumulative damage taken.
k) Medusa can use Glare when she rolls a 12. Glare instantly KO s the opponent.
l) Harry Potter has one extra life with 20 strength points.

Program Design:

See attached flowchart.

This program centers around inheritance and polymorphism from the Character class. I created member functions there that are common to all derived classes, such as getters and setters. Then I created pure virtual Attack and Defense functions as they will need to be defined differently based on each derived class' special abilities.

I chose to use pointers to Character objects for this assignment, as it makes passing class object data easier between functions.

The Menu class and Die class are reused from previous assignments, and they are tailored to this program. The Menu class handles input validation as well as the main playthrough of the game.

Test Plan:

See attached PDF.

Reflection:

This project focuses on the details. Overall, the specs aren't too difficult to pull off, but requires attention to areas such as getting and setting stats. I originally designed with just a few data members for the character classes and basic get/set functions in additional Attack() and Defense(). However, as the program continued, I discovered that I needed to add a few more counters and tracker variables to be able to correctly implement the special abilities.

An example is the dicecount variable for BlueMen. I was not completely clear on whether they lose a die when their cumulative strength drops by 4 points, or whenever they take a one-time 4 point damage. After I received clarification from the professor that it is by cumulative strength drop, I had to really re-adjust how the algorithm works in that part. I expected a simple (sp%4 == 0) conditional but it turns out that since it is cumulative, I had to account for the numbers in between multiples of 4. This means that sp 8, 7, 6, 5, will all have a dicecount of 2. Checking just at multiples of 4 did not work as expected. I'm really glad I tested this out and ended up changing my original design and instead, hardcoded the rules.

I tried to simplify and reuse code as much as I can, since this will be a multi-part project. I included flex room to accommodate new features that we will need to implement in part 2. It is a different experience accounting for future changes, and it really made me think beyond part 1's specs.

I like that this is a game, since that is my passion and the field I hope to work in. I think being able to be creative helps with many of my design decisions. I always kept in mind about how to better communicate information to the user, and how to keep the flow easy to follow.

Lastly, it has been a huge challenge this week with several assignments and test due at the same time. I really appreciate that this Project is not as demanding as the first two so that I can spend more time on my group assignment.